DOE Site:	**Hanford**
EM Project:	**WTP**
ETR Report Date:	**November 2008**

ETR-18

External Technical Review Summary

United States Department of Energy Office of Environmental Management (DOE-EM)

External Technical Review of System Planning for Low-Activity Waste Treatment at Hanford

Why DOE-EM Did This Review

Construction of the facilities of the Hanford site's Waste Treatment Plant (WTP) are scheduled for completion in 2017, with radioactive waste processing scheduled to begin in 2019. An estimated 23 to 35 years will then be required to complete high-level waste (HLW) vitrification. However, vitrification of low-activity waste (LAW) may extend the WTP mission duration by decades more if supplemental LAW processing beyond the capacity of the present facility is not incorporated. *The purpose of this independent review was to evaluate the options and to provide input to the LAW supplemental treatment process decision.*

What the ETR Team Recommended

The preferred option is a second LAW vitrification facility; however, if there is schedule flexibility, enhancement of the present LAW facility also is a potentially viable option.

The WTP low-activity waste, high-level waste, pretreatment, and analytical laboratory facilities under construction

What the ETR Team Found

A comparative schedule and cost analysis was carried out for four broad scenarios (or courses of action) to address LAW treatment needs. Each scenario was evaluated under the assumptions of treating 60,000 and 90,000 MT sodium. In addition, a minimum mission duration of 30 years was assumed to facilitate comparison with the present River Protection Program (RPP) plan; however, shorter mission durations may be possible with improvements in efficiency to operations. Each of the scenarios requires implementation of a different sequence of capital and operating expenses; therefore, each has a different cost-time profile, which is contained in the present worth analyses. The analysis indicates the following:

1. A second LAW vitrification facility (Second LAW and Enhanced Second LAW) would provide the most favorable present worth while making possible attainment of the current system plan mission completion date of 2049 for the full range of potential sodium quantities assumed to be treated (i.e., 60,000 to 90,000 MT sodium). This result is possible because of the flexibility in sizing the capacity of a second LAW vitrification facility and because the selection of an immobilization method and the capacity-sizing decision would not be required until 2017, allowing time to reduce key program uncertainties.

2. Inclusion of Early LAW treatment with any of the base scenarios (WTP Only, Present RPP System Plan, or Second LAW) results in an insignificant reduction in life-cycle present worth; however, non-financial benefits derived from Early LAW also warrant consideration.

3. Enhancements to the present LAW facility would result in a six-year mission extension beyond the current system plan completion date of 2049 and provide a favorable present worth under the assumption that 60,000 MT sodium would be treated.

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The purpose of an External Technical Review (ETR) is to reduce technical risk and uncertainty. ETRs provide pertinent information for DOE-EM to assess technical risk associated with projects and develop strategies for reducing the technical risk and to provide technical information needed to support critical project decisions. Technical risk reduction increases the probability of successful implementation of technical scope. In general, ETRs assesses technical bases, technology development, and technical risk identification and handling strategies.